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A survey of trust, control and information in
networks

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Abstract

This paper focuses on which characteristics managers take into account when they choose and evaluate business partners, and the interrelationship between the constructs trust, control and information. The paper is based on a survey which includes 101 small and middle-sized manufacturing companies in Denmark. The results show that managers frequently express that trust is an important aspect of a good relationship. Also product-related attributes and relational attributes have a bearing in a network setting. On the other hand, no significant correlation between neither trust and control nor trust and information is found. The findings indicate that the three constructs are relevant, and the level of embeddedness is found to influence both the absolute and the relative importance of the three constructs, and thereby the role of management accounting at different development stages of relationships.

Keywords: trust, management of networks, embeddedness, survey.

1. Introduction

Within the last twenty years an increased focus on interorganisational relations has been on the agenda both in the management literature and for managers in all kinds of businesses (e.g. Dacin *et al.*, 1999; Maravealis, 2001, p 12; Snow *et al.*, 1992). These relationships have been given different terms, such as: joint ventures, strategic alliances, networks, etc. (e.g. Borys and Jemison, 1989; Thorelli, 1986). In this paper the term network will be used for these interorganisational relations. Using the network framework implies that most companies, to some extent, interact with external parties to a degree that exceeds arm's-length transactions. Based on this presumption, it is fair to investigate relationships with external parties using a survey that is based on data gathered from a sampling frame counting companies derived from publicly available data sources.

Also within the management accounting literature the question of how to establish management accounting in a network setting has been discussed (e.g. Kajüter and Kulmala, 2005; Langfield-Smith and Smith, 2003; Seal *et al.*, 1999). Management accounting has traditionally focussed on the company and has thus had the hierarchy as the unit of analysis. Everything beyond the hierarchy was perceived as elements from which the company bought or sold products or services in a competitive market. As companies seem to focus on smaller parts of the value chain than before, the necessity of cooperating with other companies on activities outside these parts of the value chain has increased (Hopwood, 1996). This does not imply an increase in the number of partners that the company engages with. Often more intense cooperation with business partners is followed by a decrease in the number of partners (e.g. Dekker, 2003). It is the complexity of the product and the increased dependency of these fewer partners that create the need for more intense coordination along the value chain and thus call for more intense exchange of information than normal market transactions contain. The managerial challenges, and hence the conditions for management accounting, will change under such circumstances (e.g. Chenhall, 2003, p. 139).

When companies actively join networks, this is often followed by a reorganisation of the company. Does this change the fundamental activities of management accounting? Not at first sight. The fundamental activity of management accounting is still to provide relevant, updated and valid information promptly (Nielsen and Mortensen, 2001). What will change are the sources from where the information is to be gathered and also the group of users of the information is expected to change. When companies cooperate more closely and become dependent on the performance of other parties, information from these parties in the network will naturally become part of the management accounting system. Likewise, other decision makers than members of the company may

need information from the company in order to make decisions that benefit all participants.

Is there a need for new management accounting models in order to handle these new managerial challenges that appear in a network setting? This does not seem to be the case. It is a question of modifying and utilising existing process-oriented management accounting models in a way that fits the network context (e.g. Nielsen *et al.*, 2002). Cooper and Slagmulder (1999) support this point of view. They advocate in favour of employing target costing and kaizen costing across organisational borders. The existing management accounting models developed for usage within the individual company are hence found to be functional for management accounting in networks too.

Is it the kind of information that management accounting in networks must deal with that has to be changed? Not from an overall perspective. The activities involved in manufacturing a product are more or less the same irrespective of whether a company is vertically integrated or the activities have been split up between several companies, as is the case in the network setting. Hence the kind of information to be handled is the same. However it is required that the models generally employed within organisational boundaries are now lifted up and stretched out across the value chain, providing information to the members of the network. The fundamental difference is that management accounting information, which is often confidential, now has to be shared with parties outside the company. This entails a risk of misuse. Information sharing across organisational borders is not a technical problem; it is a mental challenge.

Intense interaction with other parties exposes the weaknesses and strengths of oneself; this is found both on a personal and on company level. Often a company will be reticent about the information they wish to share with other members of the network, since it might be abused to the disadvantage of the company's interests (e.g. Venkatesen, 1992; or Welch and Ranganath, 1992). On the other hand, information sharing is essential in order to coordinate activities, and thereby utilise the potential advantages of network participation. The extent and content of the information that one wishes to share with other members of the network will depend on the trust one has in these members.

In network research, trust is often found to be central. Trust begins where knowledge comes to an end, and thereby trust is fundamental for handling insecure, complex and threatening scenarios (Neu, 1991). Trust reduces social complexity, especially the complexity originating from the freedom of action held by other human beings (Luhmann, 2000, p. 24). Showing trust is to act as if some possible future incidents will not happen (Lewis and Weigert, 1985).

Mayer *et al.* (1995) note that trust is often mixed up with similar concepts, such as cooperation, confidence and predictability. Even though trust often makes cooperation

more efficient, it is not a necessary assumption for cooperation. It is possible to cooperate with someone you do not trust; all it takes is that you are able to control the actions of this party, and that you are able to impose suitable sanctions if the agreement is not fulfilled. This could be the case when the parties are not of equal status, like in the UK grocery retailer example given by Frances and Garnsey (1996). They show that retail shops do not need to trust their suppliers, since they are able to control the activities of the suppliers due to their dependence on the grocery chains. Trust may also be mixed up with confidence. If alternatives in relation to a specific partner are not considered, then you have confidence in this person. If, on the other hand, you actively choose a specific partner on the basis of specific criteria, then you have trust in this person. Trust is based on considerations, weighing and choice of partner; confidence is a blind action (see also Luhmann, 2000, p. 28). Finally, trust has to be more than the predictability of a person. A person that is one hundred percent predictable does not contain any element of uncertainty; therefore it is not necessary to have trust in a person if you can predict the future actions of this person for sure. Consequently, trust is rooted in the fact that people are not one hundred percent predictable, and trust is built on the foundation of experiences telling you that you can rely on a person's intentions and on this basis get involved with this person.

Trust in other people is a cognitive action that is brought into play when the available knowledge is not a sufficient foundation for an unambiguous conclusion. Within a network setting trust is the grease that enables complex transactions to be handled efficiently without excessive contracts and control mechanisms. Trust implies some kind of risk. Though, the risk is estimated under careful consideration, and in this manner, trust is the volition to bear risk. Trust cannot develop in cases of excessive doubt or suspicion about the intentions of the other party. Likewise, trust is only relevant in situations where the future actions of one's partners are unknown. Hence, trust is a condition of network relationships, since complete knowledge of the future actions of one's partners will not exist.

The importance of trust will increase in networks in two areas compared with the hierarchy and the market. In relation to the hierarchy, network participants have less possibility of control and immediate influence. Weighed against a simple market operation, the content of a network-based transaction is more complex. In both instances, the proportion of factual information is reduced, and a larger proportion of the management process must be based on trust. The increased importance of trust makes it tempting to increase the level of control; however, this may be problematic. Formal management implies control to some extent. Controlling the activities of the other members of a network can be interpreted as mistrust: if it is not based on mistrust, why

control it in the first place? Hence, there are some inherent conflicts in implementing formal management of networks.

Formal control can take many shapes. The most obvious is the written contract in which the conditions and terms of a transaction are described. However, contracts are generally found to be inefficient: firstly because they are static, and hence incompatible with the request for flexibility, which is central in a networks setting (e.g. Hedberg *et al.*, 2000, p. 135); secondly because they signal mistrust, as when a man imposes separate estate before entering a marriage (e.g. Granovetter, 1985; Bradech and Eccles, 1989; Gulatti, 1995; Uzzi, 1997). Other formal control devices could be management accounting models used across organisational boundaries.

Seal and Vincent-Jones (1997) cite several authors who state that formal management instruments, as for instance management accounting, will reduce trust within a relation. From this point of view, managing the network will restrain the efficiency of it. Does this mean that networks are uncontrollable, and that active participation in networks is like opening Pandora's box? Not necessarily. Seal *et al.* (1999) state that proper use of management accounting will facilitate that decisions made by the participants in a network are made on a more solid foundation than trust-based decisions.

Based on a number of case studies, Hedberg *et al.* (2000, p. 145) find that management of networks based on formal exchange of information is uncommon. Their studies show a certain amount of aversion to formal management of networks. Within several of the networks studied, cooperation is based on trust and a belief in the advantage of cooperation (Hedberg *et al.*, 2000, p. 161). The rationale behind this approach is understandable. Formulation of formal contracts and follow-up on these are difficult both due to the problems in describing such contracts in details, and due to the signal of mistrust implied by such contracts. From an analytical point of view, Hedberg *et al.* state that formal management of networks is a subject that has to be taken into consideration. They suggest that management control can be carried out in two dimensions: exchange of information and evaluation of partners. The dialogue between the interacting parties seems to be an important management instrument regarding the exchange of relevant information. The exchange of information can be made in the form of a number of indicators about the parties involved. It can be information about customers, business associates, products, but also information concerning cost structures is relevant. In order to manage the indicators included and their interrelationship, a formalised management system may be developed with advantage. To a wide extent exchange of information concerns sharing knowledge of what you expect of the other parties in the network (often at an operational level). Correspondingly, evaluation as management instruments involves strategic considerations about the individual partner.

Evaluation of the relations has to be made in order to determine whether the relations create value for both parties. It is essential to know whether the value is based on value added to the product in focus, or whether it is caused by access to new markets, potential business opportunities, etc. It thereby becomes relevant to evaluate more aspects of the relationship than the price of the product in focus.

Ittner *et al.* (1999) study the performance level of two kinds of sub-supplier relationships: arm's-length (market transactions) versus close coordinative relationships similar to networks. They specifically investigate different approaches regarding choice of sub-suppliers, exchange of information, evaluation of relationships, etc. They find that increased use of systematic evaluation processes has a positive effect on the performance of companies using close coordinative relationships, compared to companies primarily relying on arm's-length transactions.

Geitzman (1996) states that innovation and flexibility are most efficiently created in a network environment based on non-contractual relations. Such relations require a certain level of knowledge of each other, and thus relations of a certain level of maturity. He states that the price of the product is not sufficient information to decide on relationships. To focus mainly on the price will even damage network relations and hinder efficient relationships. In a network setting, the management control system should be able to provide information in addition to the price of a product.

Though it may be complicated and sensitive to share information within a network, companies that actively participate in networks must face that management control is a necessary - but not a sufficient - condition for success. However, new approaches have to be employed when performing management control. Managing networks must be rooted in a dialogue between the parties involved about the content of the information that is germane to be exchanged. Likewise, an agreement about the conditions under which the exchange should take place has to be made. The information generated is to be used to support strategic decisions regarding the positioning of the company within the network.

Flexibility in the shape of access to apt external resources both in quality and quantity becomes an essential strategic criterion of success. Coordination regarding these external resources is essential, and this requires exchange of information, also management accounting information. This information is often of a confidential character, and therefore, trust in network relations becomes important. Existing management accounting models are found applicable in a network setting if they are employed across organisational boundaries. However, this employment has to be made with sufficient awareness of the correspondence with the concept of trust.

The objective of this paper is to get insight into some of the managerial practices of managing network relationships. The objective is attained from two angles. First an

explorative approach is used in order to identify important aspects of managing network relationships from the viewpoint of practitioners. Second a confirmative approach is used to test the interrelationship between control, information and trust.

The paper is based on a survey including 101 small and middle-sized manufacturing companies in Denmark. The findings illustrate that trust, relational attributes and product-related attributes are found important by managers when they choose and evaluate business partners and are hence an important aspect of managing network relations. Additionally, the paper concludes that no clear-cut relationship exists between the constructs trust, information and control. This indicates that different kinds of trust, control and information are employed at different levels of embeddedness, implying that the design of management accounting systems in network settings must incorporate these dynamics.

In section two the research questions of the paper will be formulated and discussed. In section three the method employed in the survey will be delineated. In section four the results of the survey are presented; and in section five the results are discussed. Finally the paper will be rounded off by conclusions in section six.

2. Trust and management accounting in networks – research questions raised

In this section two research questions will be raised in relation to the objective of this paper. The first research question is explorative and deals with aspects that managers find important when they choose and evaluate business partners. The second research question is confirmative; it seeks to expand on and test some of the relationships between trust, information and control outlined in section two.

2.1. Expressed managerial focus in relation to network partners

As stated above, the role of management accounting is to provide decision makers with information that will assist them in managing according to the goals and strategies of the company. In order to carry out this task, management accountants must have an understanding of the worlds of these decision makers. For instance, what aspects do they find important when they evaluate business partners? For this reason it is relevant to investigate the vocabulary of managers related to describing network participation, and from this obtain insight into which characteristics managers emphasise when they cooperate across organisational borders. In order to gain insight into the awareness of managers who actively take part in managing relationships with business partners, the following research question is raised:

Research question 1: *What vocabulary do managers employ to describe important characteristics when they choose and evaluate relationships with other companies?*

Identification will be made of words that the respondents use to describe advantageous network partners, and which characteristics managers consider to be important when present relationships are evaluated and new relationships are initialised. Based on the vocabulary, it is possible to derive background concepts and to obtain an indication of how they group.

Raising this research question contributes to the objective of this paper by letting the managers be heard from their position. Though, a major weakness of this approach is that words employed are likely to contain more shades of meaning than what is directly identifiable. Getting below the surface of the identified words is not possible based on the method used here. The results can only be used as inspiration for further research and rough verification of existing findings.

2.2. The interrelationship between trust, control and information

In the literature there seems to be a general agreement that the relevance of trust becomes of increased importance in a network setting (e.g. Hedberg *et al.*, 2000, p. 19). In absolute terms the importance grows due to an increase in the amount of uncertainty originating from a more complex business environment. In relative terms the increased uncertainty stems from the managers no longer having direct influence on activities due to the strategic decision of outsourcing periphery activities. Hence manoeuvring companies in a network setting calls for more than formal control based on information.

With reference to Luhman (2000), trust is associated with the risk-related sides of social life that you choose not to seek control over caused by an intended belief that other people will not act discordant to your well-being. This means that trust is not an underlying feeling; trust is a cognitive process to which input is frequently needed in order to make sure, or reassure, that it is reasonable to consider that a person, system or device will not harm your well-being. Trust implies some kind of risk, though the risk is estimated under careful considerations and in this manner, trust is the volition to bear risk. Trust cannot develop in cases of excessive doubt or suspicion about the intentions of the other party. Likewise, trust is only relevant in situations where the future actions of one's partners are unknown.

Gietzmann (1996) reasons that the accounting system should support development of trust and by this means facilitate cooperation without excessive contractual regulation and control, whereby smoothness of cooperation is amplified. From a control perspective, the

cost of high levels of trust is reduced monitoring ability (Wicks *et al.*, 1999, p. 108). Hence, a balance between trust and control seems germane.

Traditionally trust has been considered as a substitute or complement to formal control mechanisms (Dekker, 2004); in addition to these views Das and Teng (1998) suggest a supplementary relationship between trust and control. By a substitute relationship is meant that managers employ a combination of trust and control, for instance choosing to control central parts of the relationship, or controlling the parts of the relationship that are controllable, and relying on the good intentions of the partner concerning aspects that cannot be governed using formal control mechanisms. The other approach is that trust and control are complementary control mechanisms; that is, trust and control develop together. For instance Poppo and Zenger (2002) find empirical support for a complementary relationship between formal contracts and relational governance. The third approach suggests a supplementary relationship between trust and control. Supplementary means that both trust and control contribute to the level of confidence in partner cooperation (Das and Teng, 1998, p. 496); confidence in partner cooperation is here interpreted as absorption of uncertainty. No direct relationship between trust and control exists, meaning that a change in one of the constructs will not automatically lead to a change in the other; only the level of uncertainty absorbed is changed.

The literature referred to above distinguishes between trust and control as alternative means for managing network relationships. Tomkins (2001) distinguishes between trust and information as alternative mechanisms of uncertainty absorption and thereby adds another dimension to the conundrum, which is highly relevant from a management accounting point of view. Information is obviously related to control, since control requires some kind of input, and the control process produces information intended as the foundation for action in relation to managing companies; accordingly, these two dimensions are apparently interrelated (e.g. Anthony and Govindarajan, 1998, p. 7).

Previous studies have pointed attention to either the relationship between trust and control or the relationship between trust and information; this paper contributes by focussing on the interrelationships between all three constructs simultaneously. Trust and control are perceived as uncertainty absorbing mechanisms. Information is the basis on which managerial decisions are made, and consequently, information is what provides the efficacy of the two uncertainty absorption mechanisms. It has been argued that trust becomes more important in a network setting because the information is more difficult to acquire, and hence the relative importance of formal control declines. When management accounting systems are designed, it is important to be conscious of the interrelationship between the three constructs because this is likely to have diverse

implications on the procedures of management accounting in networks. If control and trust are substitute sources of uncertainty absorption, then control and exchange of information can be made up to a certain level, and uncertainty above this level can be absorbed by trust in the business partner. This approach speaks in favour of a stable management accounting system, where the design of the system is an optimisation process made in order to minimise the managerial cost of uncertainty absorption given the actual conditions. On the other hand, if the relationship between formal control and trust is complimentary or supplementary, the mission of the management accounting system becomes more complicated: constantly manoeuvring in the field of defining what kind of information the company should share and to what extent the company is willing to - and have to - share this information with the business partner and control these compared to the level of trust the company has or seeks to have in the specific business relationship. Hence, a relevant question to raise is:

Research question 2: *In what way are the concepts trust, control and information interrelated?*

Answers to research question 2 will be explored through a set of hypotheses, formulated as the alternative hypotheses (H1).

Within the traditional framework of management accounting - the hierarchy - the relationship between information and formal control is positively correlated (e.g. Anthony and Govindarajan, 1998). Intuitively this makes sense, since the more formal control that managers employ in their management processes, the more (sophisticated) information has to be communicated to relevant members of the organisation in order to put this control into action. However, does this relationship hold in a network setting where managers have managerial focus on controlling the relations of the company?

Hypothesis 1: *The more focus is on controlling network relations, the more information is distributed between the involved parties; the correlation between network control and sharing of information is significantly higher than 0.*

As discussed above, there are three directions of the relationship between trust and control. If the variables have a substitutive relationship, they should be inversely related. Described in statistical terms this means that the variables should be negatively correlated. This situation is formulated in hypothesis 2a:

Hypothesis 2a: *Trust and control are substitute uncertainty absorbing mechanisms, and the correlation between the two variables is lower than 0.*

Contrary to hypothesis 2a is the suggestion that trust and control are complementarily related. In this situation the variables should develop together, and in this case they are expected to be positively correlated. This is formulated in hypothesis 2b:

Hypothesis 2b: *Trust and control are complementary uncertainty absorbing mechanisms, and the correlation between the two variables is higher than 0.*

If support for neither hypothesis 2a nor 2b is found, this is an indication of the existence of a supplementary relationship between trust and control; though this result is not as strong as in cases where support for one of the hypotheses is found.

The last interrelationship to be investigated concerns the relationship between trust and information. Tomkins (2001) advocates that the requirement for information depends on the maturity of the relationship, and as the relationship expands, the level of trust in the partner increases continuously. To begin with, the relationship is characterised by definite transactions carried out in accordance with the arm's-length principle; for such transactions both the level of trust and the level of information are expected to be low. If the relationship is maintained and there is a need for closer coordination than that supplied by the arm's-length transaction, the complexity and thereby uncertainty of the relationship increase. To absorb this uncertainty, the partners exchange relevant information. Simultaneously, trust is built up by successive interactions. As the relationship develops, the significance of the interactions becomes more important whereby the need for information increases. At the same time, the level of trust increases as people's knowledge of each other increases. That is, in the introductory phase of the relationship, both the level of information exchanged and the level of trust increase. At some point, the relationship has existed long enough and worked well enough for the parties to have built up a common understanding of each other. At that time the need for information in order to manage the cooperation declines, whereas the level of trust continues to increase.

In a cross-sectional study like the one presented in this paper, it is difficult to grasp the dynamics inherent in the development of relationships, and thereby the inversely U-shaped relationship between maturity and level of information exchanged, proposed by Tomkins (2001). Though in order to measure differences caused by the maturity of the relationship, the respondents have been asked to differentiate between partners to whom they are closely related and partners to whom they are loosely related. The operational

definition is based on the assumption that relationships begin with minor, less important transactions, and such relationships are defined as *loosely-related partners*. Later on the content of the relationship may develop into more important transactions, and hence the relationship consists of closely-related partners. This operational definition relies on the supposition that the maturity of a relation is perceived in relative terms and not in absolute terms, such as weeks or months. That is, in some cases a relationship goes through this development within a short period of time (Tomkins, 2001, p. 169).

Hypothesis 3a: *Trust and information are positively correlated in the initial stages of relationships where the company is loosely related to the partner; that is, the correlation between the two variables is higher than 0.*

And, trust and information are inversely related in mature stages of a relationship. This is formulated in hypothesis 3b:

Hypothesis 3b: *Trust and information are inversely related in the mature stages of relationships where the company is closely related to the partner; that is, the correlation between the two variables is lower than 0.*

The questions set forth have been evaluated based on data obtained from a survey. The conditions under which the data have been generated are to be discussed in the following section.

3. Method applied to conduct the survey

The method applied in the survey is the topic of this section. First, the design of the questionnaire is described. Then the sampling procedure will be outlined. Finally, the reliability of the variables employed in the subsequent analyses is evaluated.

3.1. Design of the questionnaire

The questionnaire has a length of four pages, and it is divided into five parts¹. In the first part, the respondents are required to answer some general descriptive questions regarding the company that they represent. The second part consists of an open-ended question, where the respondents are asked to describe what in their opinion makes a good relationship with other companies, and thereby bring to light important characteristics of interorganisational cooperation. The open-ended question is placed in

¹ The questionnaire can be found in appendix A.

the beginning of the questionnaire in order to reduce any bias caused by respondents adopting the vocabulary employed in the rest of the questionnaire.

The remaining parts of the questionnaire contain fixed alternative questions related to the network of the company that the respondent represents. In order to obtain a sufficient sensitivity of the variables, they have been measured using a multi-item scale for each variable. Each item has a statement associated to it, and these statements are formulated in a way that makes it possible to measure the multifaceted nature of the variable in focus. For each item the respondents are asked to express their opinion about the statement on a 5-point Likert scale ranging from strongly disagree to strongly agree; regarding the scales related to sharing of information, the 5-point scale ranged from never to all the time.

The questionnaire was tested first by a number of potential respondents who were observed and told to 'think aloud' while they answered the questionnaire. Afterwards they were interviewed in order to investigate whether they understood the questions in the way they were expected to; this was done in order to secure validity. Subsequently, the questionnaire was sent to 120 companies in a pilot study of which 40 questionnaires were returned, and the results were analysed using the reliability analysis package in SPSS in order to ensure the reliability of the multi-item scales. The pilot study caused changes in some of the multi-item scales. Some items were excluded and replaced by new ones, and for some of the items, the adjective was changed in order to adjust for skewness.

3.2. Sampling procedure

The population is manufacturing companies in Denmark having between 20 and 200 employees. This size of company has the advantage that it is reasonable to contact just one person in the company as you may rely on this person having sufficient insight into the business procedures of the company that he or she represents. It is also found to be likely that this kind of company is more dependent on their business relations, and hence more familiar with the business processes in a network setting. Manufacturing companies are chosen because they are typically placed in the middle of the value chain, having a role as sub-suppliers. Hence they are likely to have partners that they must share information with in order to gain knowledge of the requirements of the end user and get these requirements implemented in the products that the manufacturing company produces.

The choice of this population entails certain limitations regarding the ability to conclude on network companies on a generalising level. First of all, there is no guarantee that the included companies are really participating in a network setting. The survey will most likely provide answers regarding companies in general and their procedures for

handling cooperation with business partners. Secondly, the smaller companies included in the survey may not have an explicit strategy for managing business relationships; they simply assign to the conditions of doing business in the environment that they participate in. If this is the case, the contingency theoretical framework employed collapses. So the choice of population has some limitations, and it is definitely not possible to conclude on a general level based upon the results obtained. However, the purpose is to create insight into the field of practice, and based on this to goal direct the further qualitative studies; with this purpose in mind, the choice of population is found to serve its point.

The sampling frame used is the CD-Direct database, which is based on information from the *Danish Commerce and Companies Agency*. The sampling frame has been trimmed by removing companies that were obviously misplaced, and in cases where companies were included several times, excess entries were removed, and thereby each company was only represented once. The net sampling frame consisted of 2,505 companies, and from this frame a random sample of 400 companies was made. The random sample technique was chosen in order to find both companies that rely on close relationships with other parties and those that do not. The different backgrounds of the companies are important in order to identify diversities between the different approaches of the companies.

The survey began on 8th of August 2003, ensued by a follow-up letter sent out on 13th September 2003. Of the 400 questionnaires sent out, 101 useable replies were returned; this corresponds to a response rate of 25.7 percent. The specification of the replies can be found in table 1.

In all 133 replies were given; 24 percent of these were replies stating that the respondent would not participate in the survey. The most frequent reason given was

Table 1
Specification of replies to the survey

	Based on initial letter	After follow-up letter	Total
	----- no. of replies -----		
Replies unwilling to participate	17	15	32
Returned useable questionnaires	74	27	101
Returned unusable questionnaires	0	0	0
Total replies	91	42	133
Reply rate	23.2%	10.7%	33.8%
Response rate	18.8%	6.9%	25.7%

Note: Gross sample is 400 respondents, of these 7 turned out not to be part of the population, which results in a net sample of 393 potential respondents.

company policies saying that they were not allowed to spend time on participating in surveys. From table 1 it can be calculated that the fraction of respondents who declared that they would not participate rose from 19 percent in the initial round to 36 percent in the round where the respondents have received the follow-up letter. Due to this rise and a more rough tone in the refusals, it was decided not to send out a third reminder letter.

In order to test whether the profiles of the companies from which useable questionnaires were received were representative of the population, a number of log-linear tests were made. The tests involved the industrial distribution of the included companies and the size of the companies, measured as both number of employed persons and the annual turnover. None of the tests showed any significant differences between the population and the companies that participated regarding the variables industry, number of employees and annual sales.

In order to test for selection bias, one question was included in the questionnaire to measure the perceived relevance of the topic of the questionnaire regarding the situation of the company; this test showed no significant difference between the group of respondents who returned the questionnaire in the first round and those who returned it after the follow-up letter was sent out.

There have been only minor problems with missing values. In five cases the respondents did not answer one or two items; in these cases the missing value was replaced by the mode of the variable for respondents who had the same profile of answers in relation to the remaining items included in the actual multi-item scales.

3.3. Reliability of the employed variables

In order to evaluate the reliability of the multi-item scales, the scales were analysed by reliability analysis and confirmative factor analysis. The corresponding Chronbach's alpha values and the percentage of the variance explained by the single factor are tabulated in table 2.

In general, the Cronbach's alpha value of the included variables is at an appropriate level. Nunally (1978) suggests that an appropriate level of Cronbach's alpha is 0.7 or higher in order to grasp a single latent variable. The variable trust does not reach this level. On the other hand, 45 percent of the variance included in the multi-item scale is explained by this single factor. This indicates that sufficient information is included in the variable, and hence it is acceptable to use the variable in the analyses.

Table 2

Included variables based on batteries of items; showing number of items employed in each multi-item scale and the associated Chronbach's alpha value

Variables	Number of items included	Cronbach's alpha	% variance explained by single factor
Network control	6	0.87	62
Trust	4	0.58	45
Share information with:			
partners closely related to	4	0.70	53
partners loosely related to	4	0.84	68

3.4. Analyses of the data from the survey

Based on the open-ended question, an answer to research question one is searched for. The statements made by the respondents have been analysed by counting the frequency of the key nouns. The key nouns are used as depictions of good network relations seen from the perspective of people who are concerned with this topic in practice. The most frequently used key nouns have been analysed further by a cluster analysis in order to search for possible patterns in the way the nouns are used by the respondents. The analyses can rightly be labelled a *descriptive fishing exercise*. However, the analyses are intended to serve as a cursory study of network management seen from the perspective of practitioners, and as such the results can be used as inspiration for further research.

The second research question is investigated by latent variable structural equation analysis. This approach has the advantage of lowering random measurement errors by simultaneous estimation of both the measurement model and the latent variable model (e.g. Baines and Langfield-Smith, 2003; Magner *et al.*, 1996; Wouters *et al.*, 2005). Structural equation analysis is typically recommended to be made on more observations than this survey consists of. Bearden *et al.* (1982) mention two rules of thumb regarding sample size in structural equation analysis: one recommending that the sample size should exceed the degrees of freedom of the structural equation model plus 50, and another recommending a sample size larger than 200 observations. Neither of these rules is kept in this survey. Later contributions regarding sample size and structural equation analysis suggest that smaller numbers of observations can be justified if adequate procedures during estimation of the model are followed (e.g. Lee and Song, 2004). However, such procedures are not conducted here, and as such the results have to be

interpreted with the objective of the survey in mind, namely to get insight into some of the managerial challenges arising from acting in a network setting, and with these as point of origin seek for inspiration for how to contribute to the work on the development of management accounting systems in networks.

4. Presentation of the results

In this section the results of the survey related to the research questions of this paper will be presented. Discussion of the results is made in section 5.4.

4.1. Vocabulary used to describe good network relations – analysis of the open-ended questions

The respondents were asked: ‘...*shortly to describe what you believe makes an advantageous relationship with other companies? E.g. based on which criteria do you choose business partners to cooperate with?*’. In this analysis, answers obtained from both the pilot study and the main study have been used. The formulation of the questions related to the open-ended sections were the same, and the data could be used jointly without any problems. In all 123 respondents are included in this analysis; this corresponds to 88 percent of the respondents who returned a usable questionnaire.

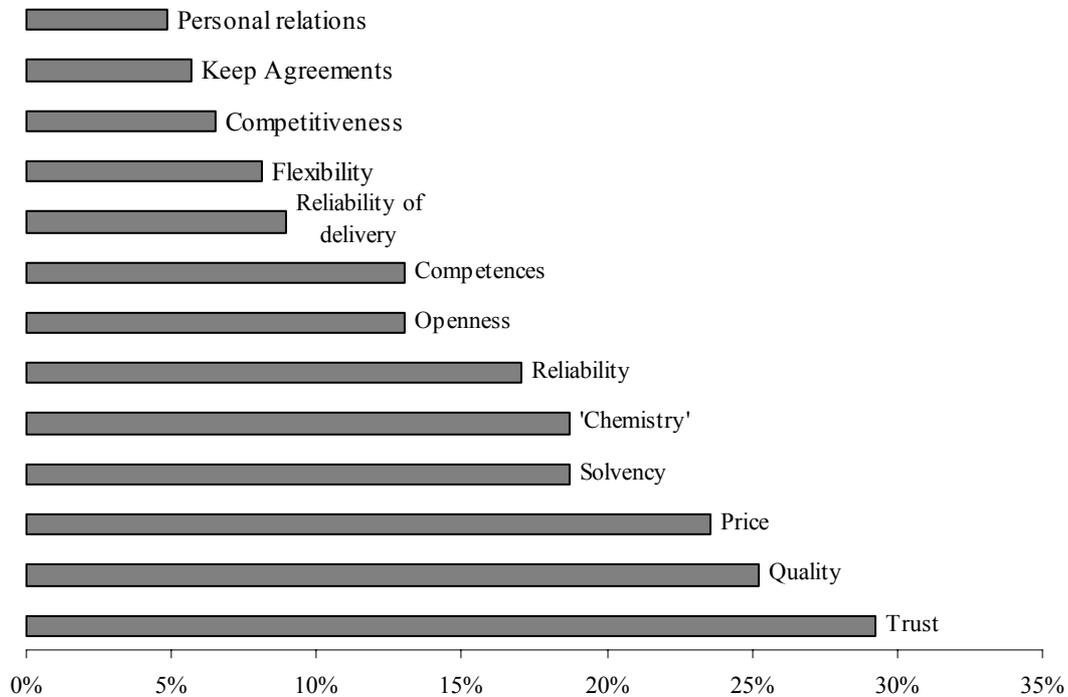
The analysis revealed 13 nouns used very frequently; obviously other nouns were employed, but these only counted for 1 or 2 of the respondents. The most frequently used nouns are presented in figure 1. The nouns more or less speak for themselves, however a few need further elaboration.

The noun most frequently referred to is trust. This is congruent with the literature in the field as discussed above. It could be argued that trust is a product of the other concepts; that is, trust is built on positive experiences of for instance openness, chemistry, etc. However, such a correlation cannot be verified based on the present data, and therefore trust is regarded in line with the other concepts included. Gallivan and Depledge (2003) conducted a content analysis which included 16 published case studies. They found that 9 out of the 16 case studies included one or more passages stating a need for trust, corresponding to a higher frequency of mentioning trust than was found in this study. The study by Gallivan and Depledge (2003) is based on other premises than the survey presented here; hence the results are not directly comparable. Nevertheless, though the 30 percent of the respondents mentioning trust found in this survey seems high, it is of probable magnitude compared to the findings of Gallivan and Depledge.

Concerning price it is remarkable that when the respondents mention price, it is usually associated with an adjective such as: ‘the right price’, ‘a fair price’, ‘a reasonable price’, etc. This indicates that price matters, but that the respondents recognise that other

Figure 1

Percentage of respondents who have used the specific noun when describing important aspects of network cooperation



Note: The results are based on answers from 123 persons.

aspects of the product are at least as important, and that these aspects to some extent make it unreasonable to discuss a lowest price. It also indicates that the respondents are aware that the other party has to profit from the relationship. As one respondent states: *'...all members must benefit from the partnership.'* This statement is congruent with Boersma *et al.* (2003, p. 1037) who find that the involved parties in relationships are concerned with the importance of mutual economic advantage. The motive for this concern is that the prospect of a fair profit will commit the partners to the mutual goals. Creating this win-win situation enables the parties to have a hold on each other that facilitates trust. The prospect of economic gains lays the ground for intense commitment and cooperation, which is necessary for the development of the relationship.

From the descriptions made by the respondents, it is found that solvency is used as an indicator of the seriousness of the partner. The respondents look for: 'strong financial position', 'financial safety', etc. Of course solvency is a matter of security of payment for the products to be delivered. However, solvency is also applied as an indicator of whether potential partners are worth an investment of time and resources, and in this way solvency

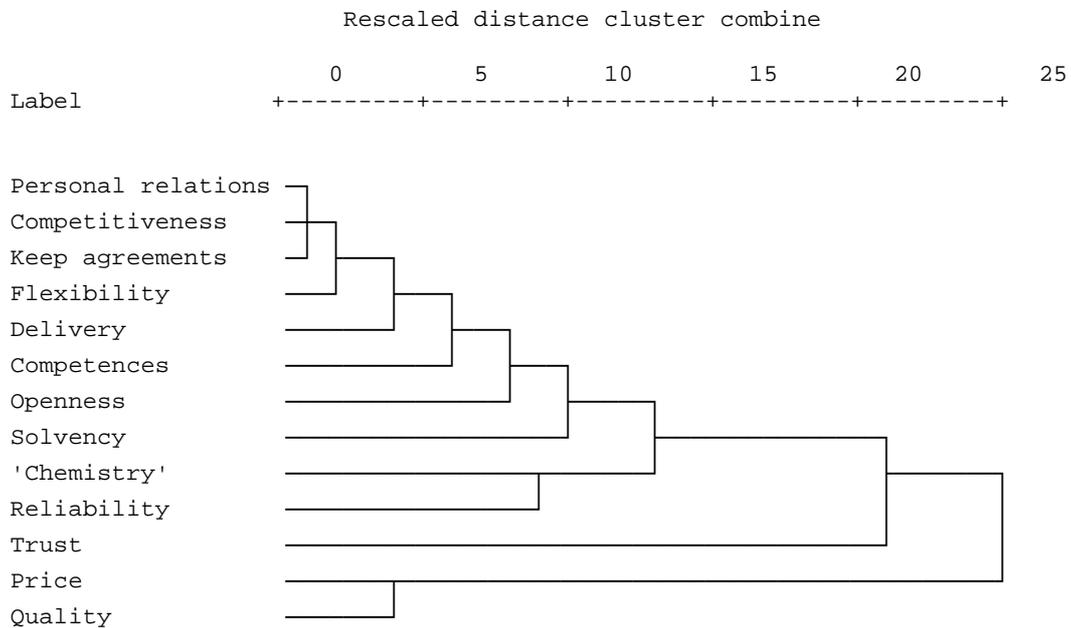
is an indicator of the probability of a positive execution of the economic potentials of the relation, and thereby the level of trust you are willing to put in a given relation.

Kulmala *et al.* (2002) argue that open-book accounting is a necessity for a successful relationship. Despite this, they found only two examples of open-book accounting in their study. Seal *et al.* (1999) found that despite good intentions, an open-book agreement was not reached between the parties observed. In the study presented here, only one respondent clearly expresses an expectation of: ‘*open calculations*’, and hence this finding is in line with the examples of prior research mentioned. It is an unanswered question whether the noun *openness*, mentioned by 13 percent of the respondents, includes sharing of financial information or whether it is related to the characteristics of the people representing the business partners. However, as will be presented in figure 4 below, exchange of financial information takes place relatively infrequently, indicating that openness does not include the books.

In a search for patterns from the 13 most frequently mentioned nouns, a hierarchical

Figure 2

Dendrogram from cluster analysis of the most frequently used nouns related to important aspects of network cooperation



Note: The cluster analysis is made in the SPSS package, ver. 12.0. The clustering method applied is Ward’s method; the similarity measure is variance.

cluster analysis has been conducted. Ward's method is applied as clustering method since this method is designed to minimise the variance within clusters (Aldenderfer and Blashfield, 1984, p. 43). The dendrogram from the cluster analysis is presented in figure 2.

Using the widest range over which the solution is not changed as indicator of a good solution (Lattin *et al.*, 2003, p. 281), the dendrogram indicates three clusters. The cluster analysis indicates one group of respondents who emphasise several characteristics of the network partners and their ability to cooperate. Secondly a cluster of respondents who focus on trust in business partners is identified. Finally a third cluster of respondents who focus on traditional attributes of the product in focus - price and quality - is found. A natural second step would be to test whether respondents in the clusters do group according to a tendency towards embedded or arm's-length ties (Uzzi, 1996); however, the data available does not allow further statistical analysis of this kind.

There is some overlap in the words used by the respondents, and the wording employed in the questionnaire. The design of the questionnaire with the open-ended question in the beginning was made in order to reduce bias from this source. Some of the respondent may not have started out with the open-ended question, and consequently bias may be present. However, the answers from a few of the respondents who were asked about this afterwards indicate that they have filled in the questionnaire by starting with the first page and ending with the last, and bias from this source is considered to be of minor significance.

To sum up on the findings regarding research question one, when managers describe characteristics of advantageous relationships, they mention several attributes. Trust, quality and price are the most frequently mentioned attributes. Analysing the answers using hierarchical cluster analysis revealed three clusters. One cluster of respondents emphasise product-related attributes: price and quality. One cluster of respondents emphasise trust. And the members of the last cluster emphasise relational attributes.

4.2. Correlations between trust, control and information

In this section an answer to research question 2 will be sought. The basis of the analysis is the four multi-item scales; the latent variables are: network control, trust, information sharing with closely-related partners and information sharing with loosely-related partners.

The variable network control measures the degree of control that the manager puts into evaluating and focussing on the importance of the networks of the company. When companies develop core competences, are met by new demands from customers and face product innovation, this will influence the requirements that the company has to set for their partners in order to keep their value-creating process flexible and ensure quick

responses. Consequently it is likely that managers set more or less explicit objectives for the partners, which they are related to.

The trust variable measures the respondents' perception of the importance of trust in business partners in general. The outcome of the scale is an indication of how important trust is as uncertainty absorption mechanism.

The information sharing variables set focus on four different types of information. The four dimensions are: exchanging information on an informal basis, exchanging non-financial information on a formal basis, exchanging economic information and exchanging information of strategic importance. The sharing of information variables measure the level of information exchanged with business partners. The variables are operationally defined as the frequency with which the four different types of information are exchanged with partners closely related to and partners loosely related to respectively.

The measurement models and the latent variable model including the correlation coefficients between the latent variables have been estimated simultaneously by structural equation analysis. The covariance matrix used for estimating the model is tabulated in appendix B. The latent variable model is sketched in figure 3; coefficients corresponding to the measurement models are tabulated in appendix C.

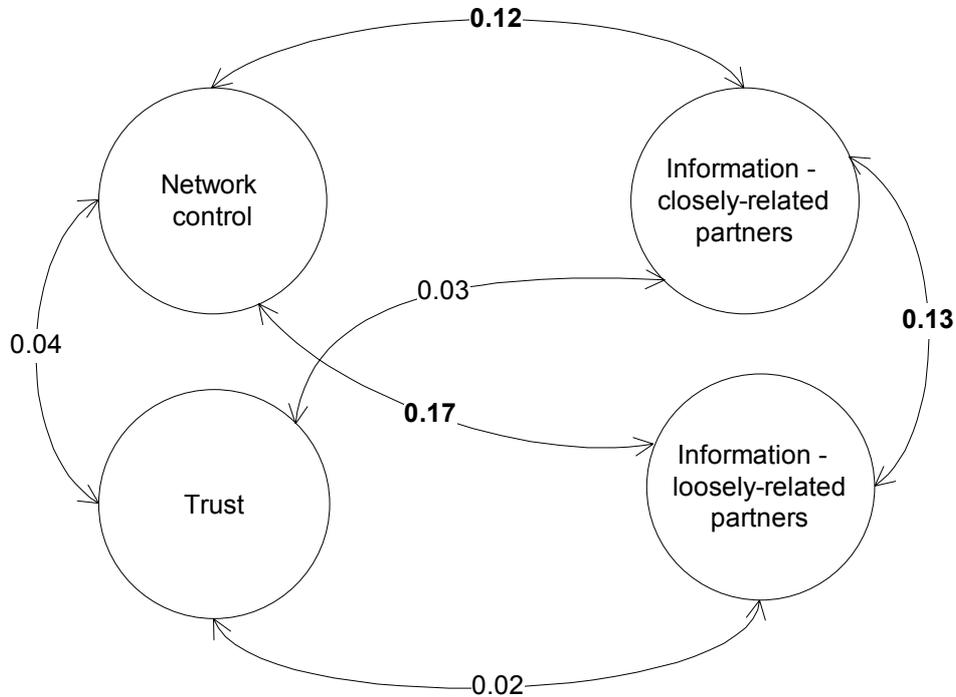
Based on a generalised least squares solution, the chi-square value of the structural equation model is 131.32, and with 125 degrees of freedom, this corresponds to a probability level of 0.33. This probability level signifies that the estimated covariance matrix matches the population covariance matrix. The Adjusted Goodness of Fit Index (AGFI) of the model is 0.80. Hence, taking the degrees of freedom into account, and employing the standard cut-off value regarding the AGFI of 0.8 (Sharma, 1996, p. 159), the fit of the model is found to be appropriate.

The estimated correlation coefficients between network control and information - loosely-related partners, and the correlation coefficients between network control and information - closely-related partners are both very significant, supporting hypothesis 1. It is remarkable that the correlation coefficients are low, indicating that other factors are involved when managers control the relationships of the networks they are part of.

A significant correlation coefficient between the two information variables is also found. In all, this indicates that information sharing with partners is an important part of the process of managing the relationships of companies; though the correlation coefficient is lower regarding partners closely related to, compared to partners loosely related to. This might have indicated that managers do not share information with partners that their companies are closely related to, but instead they rely on trust as uncertainty absorption mechanism when controlling these relationships. However, both correlation coefficients

Figure 3

Correlation coefficients between the latent variables: network control, trust, information – closely-related partners and Information – loosely-related partners.



Note: Correlation coefficients in bold are significant at the 0.01 level (2-tailed). The remaining coefficients are not significant at any relevant level of significance. The coefficients corresponding to the complete structural equation model are tabulated in appendix B.

between trust and the information variables are insignificant; and in addition, the coefficients are of the same magnitude, and thereby no support for this proposal is found.

Neither hypothesis 2a nor hypothesis 2b is supported by the model. Thereby the survey gives no clear answer to the question of the interrelationship between trust and control. However, this leaves room for research of a supplementary relationship between the constructs, as proposed by Das and Teng (1998).

As pointed out above, the survey lacks an explanation for the correlation between trust and the two information variables; hence no support for hypothesis 3a and 3b was found.

Summing up on research question two, it can be concluded that the only significant correlation between the three included constructs is between network control and information sharing. This goes for both information sharing with partners loosely related to and information sharing with partners closely related to. Also the correlation coefficient between the two information variables was found to be highly significant. No

significant relationship between trust and network control and between trust and information sharing was found. The lack of any sign of a simple relational explanation to the interrelationship between the concepts must not lead to the conclusion that no interrelationship exists. In fact the lack of significant correlations indicates that propositions made by several scholars of factors that moderate or determine the interrelationship are potential directions for further research.

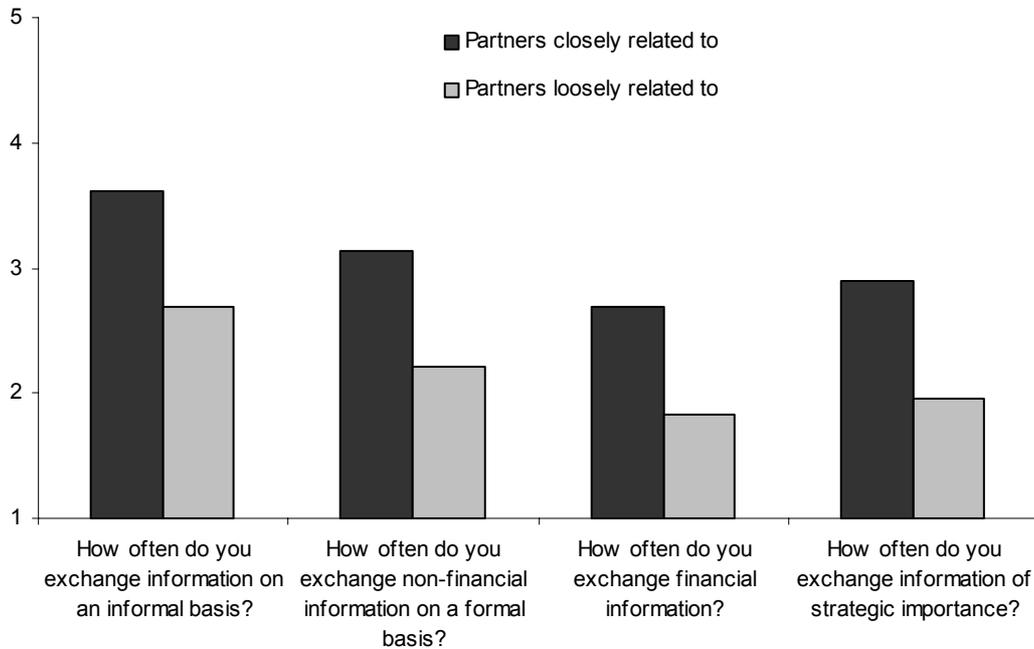
5. Discussion of the results from the survey

The survey presented took both an explorative and a confirmative approach; the two approaches were studied using an open-ended question and fixed alternative questions respectively. The open-ended question showed that trust and related characteristics are important attributes of managing interorganisational relationships; it also showed that attributes related to control and potential carriers of information are on the agenda when managers describe aspects of managing the relationships of their company. Conversely, the fixed alternative questions did not show empirical evidence of any naive correlation between trust and neither of the two information variables, nor the control variable. These diverging findings are noteworthy and indicate that the interrelationship between trust, control and information is more than just a question of either a substitute or a complementary relationship; and a multi-faceted perception of the concepts is necessary in order to understand the interrelationship between the three focal constructs. It was expected to find some kind of relationship between the network control variable and the trust variable. This was not possible based on the present data, indicating a supplementary relationship, as proposed by Das and Teng (1998). The operational definition of network control employed in the survey primarily includes elements of what Das and Teng (2001) label behaviour control and output control, utilised for control of the relationships from an internal perspective. Output control and especially behaviour control are less important control mechanisms in relation to network partners, particularly in the initial stages of a relationship; in these stages the primary control mechanism between the parties is social control (Langfield-Smith and Smith, 2003).

Figure 4 presents the average frequency of the four different aspects of information that were included in the survey. The item mean for the multi-item scale for partners strongly related to is 3.08, and the item mean for partners loosely related to is 2.17; hence, the overall level of information sharing with loosely related partners is less intensive than with strongly related partners. Looking at the four dimensions separately indicates that information sharing on an informal basis is the most frequently drawn on source of information sharing. Subsequently non-financial information on a formal basis is frequently exchanged. Least frequent is exchange of financial and strategic information.

Figure 4

Average frequency of exchange of four kinds of information with partners closely related to and partners loosely related to, ranging from never (1) to all the time (5)



Exchange of information on an informal basis is an instrument for conducting social control. Exchanging information informally enables the parties to approach each other and at the same time build up trust, which can explain both the great emphasis put on trust, found in the open-ended question of the survey, and the relatively high frequency of exchanging information informally. That is, exchange of information on an informal basis is used to maintain the relationship and to carry out social control; whereas the more specified and formalised exchange of information takes place when specific agreements are made and carried out. This tendency goes for both partners closely related to and partners loosely related to.

Tomkins (2001) differentiates between information needed to build up trust and he information needed to control cooperative activities; the former kind of information is labelled type 1 information, and the latter kind of information type 2 information. Type 1 information is primarily related to information about competences and integrity both by actions and communication. Type 2 information regards the planning of the activities of the involved parties. Even though Tomkins differentiates between two kinds of information, he points out that albeit type 2 information is primarily used to manage and control the activities in the relation, this information will influence the content of type 1

information. Thereby type 2 information indirectly contributes to the maintenance and development of trust in the relationship.

The findings presented in this paper have the weakness of not differentiating between the various development stages of a business relation. Despite this, it is remarkable that the nouns presented in figure 1 to a large extent are similar to the kind of type 1 information that Tomkins (2001, p. 179) hypothesises to be used at different stages of business relationship development. Table 3 presents the proposals made by Tomkins (2001) on how information is used to build up trust and facilitate cooperation during the development stages of relationships. These proposals have been merged with the empirical findings presented, where the respondents in their own words express important aspects of managing network relationships. The table also shows possible

Table 3

Similarities between hypothesised information characteristics set forth by Tomkins (2001) and findings obtained from the open-ended question in the present survey.

Type 1 information hypothesised by Tomkins ^{a)}	The findings of this survey	
	Open-ended question	Exchange of managerial information
Financial attributes	Solvency	Publicly available financial statements
Values, integrity and ethics: the way they do business	'Chemistry', reliability, openness, personal relations	Informal sharing of information: discussing current problems, exchanging gossip, etc.
Technological, market and network positioning	Competences, flexibility	Information of strategic importance: status of relevant product development projects, marketing plans, etc.
Reliable achievement of milestones, costs, quality, etc.	Keep agreements, reliability of delivery, price, competitiveness, quality	Non-financial information and financial information: relevant performance measures, incoming orders, plans of production, profitability of products, cost structures, etc.

a) Tomkins (2001), table 2.

sources and carriers of the information. For instance, information on financial attributes and solvency is available through financial statements. Information regarding values and personal relations is more likely to be exchanged through informal sharing of information where the parties sound each other out.

Though the survey does not capture the dynamics of relationship development, the existence of the awareness of the kind of information proposed by Tomkins (2001) indicates that the role of management accounting has to change as the relationship matures, and that the framework proposed by Tomkins (2001) is a relevant starting point for mapping these dynamics.

6. Conclusion

This paper contributes to the research project by combining exploratory and confirmatory findings of relevant attributes of managing network relationships. Though trust and several kinds of information are employed as control mechanisms in network relationships, the paper implies that no simple interrelationship between trust, control and information exists. Hence, attempts to solve the managerial puzzle within a network setting have to be conducted with due respect for the dynamics between the three constructs as relationships evolve.

The paper is based on a survey including 101 questionnaires filled in by managers of small and middle-sized manufacturing companies in Denmark. The purpose of the survey was to give answers to two research questions proposed.

The first question regarded the vocabulary employed in order to describe advantageous network partners. The analysis showed that the single most frequently mentioned attribute was trust. The second most frequently mentioned attributes were quality and price of the product in focus. Hereafter a number of attributes centred on several qualitative measures of the relationship were mentioned. The open-ended answers indicated that the relationships described were characterised by overembeddedness. This indicates that the role of management accounting in a network setting needs to focus on behavioural aspects of coordination since narrow-minded management will damage sharing of information and joint coordination. Thus management accounting information should be used for directing attention and as starting point for dialogue.

The second research question concerned the interrelationship of trust, control and information. It shows that trust does not correlate with neither sharing of information nor control. This finding calls for a more differentiated view of these interrelationships than most often found in the literature. Since trust apparently matters, management accounting has to be adjusted to the actual development stage of the relationship.

From the discussion of the findings from the survey, it was deduced that the hypothesis set forth by Tomkins (2001) is congruent with the empirical findings of the survey. That is, management accounting information shared in the initial stages of a relationship should contain precise and less sensitive information, though the information should still signal trust in the other party in order to build trust and develop the relationship. Later in the development of a relationship, when the partners become embedded, more sensitive and hard-core managerial information is to be shared in order to coordinate and exploit the potentials for cooperation. The discussion indicated that from an embedded tie point of view, it becomes important to manage the entire portfolio of network partners in order to avoid a situation where the company is no longer able to manoeuvre agilely and respond to the needs of their customers. Hence, in addition to supplying information for the ongoing management of network cooperation, the management accounting system also has to be able to keep track of the competences available through the portfolio of network relations.

In the search for a deeper understanding of the role of management accounting in networks, two questions need further investigation. Firstly, it is important to gain more knowledge of the interplay between information and trust. It is found that if a deeper understanding of this interplay at different stages of the interorganisational relationships is established, then the basis can be made for determining which role management accounting must play at the different stages of the life cycle of a relationship. Secondly, it is important to investigate how management accounting can be used to give directions for the managerial process that is required in order to maintain and develop the relations of the companies within networks. Work has to be made on how this dynamics can be operationally defined and made explicit and put into action as a performance indicator in line with other managerial challenges that managers of complex organisations have to deal with.

References

- Aldenderfer, M. S. and Blashfield, R. K., 1984. *Cluster Analysis*, California, Sage Publications.
- Anthony, R. N. and Govindarajan, V., 1998. *Management Control Systems*, 9th edition, McGraw-Hill.
- Baines, A. and Langfield-Smith, K., 2003. Antecedents to management accounting change: a structural equation approach, *Accounting, Organizations and Society*, **28**(7-8), 675-698.
- Bearden, W. O., Sharma, S. and Teel, J. E., 1982. Sample size effects on chi square and other statistics used in evaluating causal models, *Journal of Marketing Research*, **19**(4), 425-430.
- Boersma, M. F., Buckley, P. J. and Ghauri, P. N., 2003. Trust in international joint venture relationships, *Journal of Business Research*, **56**, 1031-1042.
- Borys, B. and Jemison, D. B., 1989. Hybrid Arrangements as Strategic Alliances: Theoretical Issues in Organizational Combinations, *The Academy of Management Review*, **14**, 234-249.
- Bradech, J. L. and Eccles, R. G. 1989. Price, Authority, and Trust: From Ideal Types to Plural Forms, *Annual Review of Sociology*, **15**, 97-118.
- CD-Direct, Købmandsstandens Oplysningsbureau, Copenhagen.
- Chenhall, R. H., 2003. Management Control Systems Design Within its Organizational Context: Findings from Contingency-Based Research and Directions for the Future, *Accounting, Organizations, and Society*, **28**, 127 - 168.
- Cooper, R. and Slagmulder, R., 1999. *Supply Chain Development for the Lean Enterprise: Interorganizational Cost Management*, Portland, Oregon, Productivity.
- Dacin, M. T., Ventresca, M. J. and Beal, B. D., 1999. The Embeddedness of Organizations: Dialogue and Directions, *Journal of Management*, **25**, 317-356.
- Das, T. K. and Teng, B., 1998. Between Trust and Control: Developing Confidence in Partner Cooperation in Alliances, *Academy of Management Review*, **23**, 491-512.
- Das, T. K. and Teng, B., 2001. Trust, Control, and Risk in Strategic Alliances: An Integrated Framework, *Organization Studies*, **22**, 251-283.
- Dekker H. C., 2003. Value chain analysis in interfirm relationships: a field study, *Management Accounting Research*, **14**, 1-23.
- Dekker, H. C., 2004. Control of Inter-Organizational Relationships: Evidence on Appropriation Concerns and Coordination Requirements, *Accounting, Organizations, and Society*, **29**, 27-49.
- Frances, J. and Garnsey, E., 1996. Supermarkets and Suppliers in the United Kingdom: System integration, Information and Control, *Accounting, Organizations, and Society*, **21**, 591-610.
- Gallivan, M. J. and Depledge, G., 2003. Trust, Control and the Role of Interorganizational Systems in Electronic Partnerships, *Information Systems Journal*, **13**, 159-190.
- Gietzmann, M. B., 1996. Incomplete Contracts and the Make or Buy Decision: Governance Design and Attainable Flexibility, *Accounting, Organizations, and Society*, **21**, 611-626.
- Granovetter, M., 1985. Economic action and social structure, *American Journal of Sociology*, **91**(3), 481-510.

- Gulatti, R., 1995. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances, *Academy of Management Journal*, **38**(1), 85-112.
- Hedberg, B., Dahlgren, G., Hansson, J. and Olve, N., 2000. *Virtual Organizations and Beyond: Discovering Imaginary Systems*, Chichester, Wiley.
- Hopwood, A. G., 1996. Looking Across Rather Than Up and Down: On the Need to Explore the Lateral Processing of Information, *Accounting, Organizations, and Society*, **21**, 589-590.
- Ittner, C. D., Larcker, D. F., Nagar, V. and Rajan, M. V., 1999. Supplier selection, monitoring practices, and firm performance, *Journal of Accounting and Public Policy*, **18**(3), 253-281.
- Kajüter, P. and Kulmala, H. I., 2005. Open-book accounting in networks potential achievements and reasons for failures. *Management Accounting Research*, **16**(2), 179-204.
- Kulmala, H. I., Paranko, J. and Uusi-Rauva, Erkki, 2002. The role of cost management in network relationships, *International Journal of Production Economics*, **79**, 33-43.
- Langfield-Smith, K. and Smith, D., 2003. Management Control Systems and Trust in Outsourcing Relationships, *Management Accounting Research*, **14**, 281 - 307.
- Lattin, J. M., Carroll, D. J. and Green, P. E., 2003. *Analyzing multivariate data*, 2nd printing, Pacific Grove, California, Thomson Brooks/Cole.
- Lee, S. and Song, X., 2004. Evaluation of the bayesian and maximum likelihood approaches in analyzing structural equation models with small sample sizes. *Multivariate Behavioural Research*, **39**(4), 653-686.
- Lewis, J. D. and Weigert, A., 1985. Trust as Social Reality, *Social Forces*, **63**, 967-985.
- Luhmann, N., 2000. *Vertrauen - Ein Mechanismus der Reduktion Sozialer Komplexität*, 4th reprint, Stuttgart, Lucius and Lucius.
- Magner, N., Welker, R. B. and Campbell, T. L. 1996. Testing a model of cognitive budgetary participation processes in a latent variable structural equations framework, *Accounting and Business Research*, **27**(1), 41-50.
- Maravelias, C., 2001. *Managing network organizations*, Doctorial dissertation, Stockholm, School of Business, Stockholm University.
- Mayer, R. C.; Davis, J. H. and Schoorman, F. D., 1995. An integrative model of organizational trust, *Academy of Management Review*, **20**(3), 709-734.
- Neu, D., 1991. Trust, Contracting, and the Prospectus Process, *Accounting, Organizations, and Society*, **16**, 243-256.
- Nielsen, S. and Mortensen, O., 2001. Logistik og økonomistyring set i lyset af IT integrerede relationer: nogle spørgsmål og perspektiver, *Ledelse og Erhvervsøkonomi*, **65**(3), 163-179.
- Nielsen, S.; Mortensen, O. and Nielsen, J., 2002. Supply chain management og supply chain costing: et teoribaseret casestudie med vægt på rentabilitetsformålet, *Ledelse & Erhvervsøkonomi*, **66**(3), 125-142.
- Nunnally, J. C., 1978. *Psychometric theory*, 2nd edition, McGraw-Hill.
- Poppo, L. and Zenger, T., 2002. Do Formal Contracts and Relational Governance Function as Substitutes or Complements?, *Strategic Management Journal*, **23**, 707-725.

- Seal, W. and Vincent-Jones P., 1997. Accounting and Trust in the Enabling of Long-Term Relations, *Accounting, Auditing and Accountability Journal*, **10**, 406-431.
- Seal, W., Cullen, J., Dunlop, A., Berry, T. and Ahmed, M., 1999. Enacting a European Supply Chain: A Case Study on the Role of Management Accounting, *Management Accounting Research*, **10**, 303-322.
- Sharma, S., 1996. *Applied multivariate techniques*, 2nd printing, New York, Wiley.
- Snow, C. C., Miles, R. E. and Coleman, H. J., 1992. Managing 21st Century Network Organizations, *Organizational Dynamics*, **21**, 5-20.
- Thorelli, H. B., 1986. Networks: Between Markets and Hierarchies, *Strategic Management Journal*, **7**, 37-51.
- Tomkins, C., 2001. Interdependencies, Trust and Information in Relationships, Alliances and Networks, *Accounting, Organizations, and Society*, **26**, 161-191.
- Uzzi, B., 1996. The sources and consequences of embeddedness for the economic performance of organizations: the network effect, *American Sociological Review*, **61**, 674-698.
- Uzzi, B., 1997. Social Structures and Competition in Interfirm Networks: The Paradox of Embeddedness, *Administrative Science Quarterly*, **42**, 35-67.
- Venkatesen, R., 1992. Strategic outsourcing: to make or not to make, *Harvard Business Review*, **70**, (November - December), 98-107.
- Welch, J. A. and Ranganath, N. P., 1992. Strategic sourcing: a progressive approach to the make-or-buy decision, *Academy of Management Executive*, **6**(1), 23-31.
- Wicks, A., Berman, S. L. and Jones, T. M., 1999. The structure of optimal trust: Moral and strategic implications, *The Academy of Management Review*, **24**, 99-116.
- Wouters, M.; Anderson, J. C. and Wynstra, F., 2005. The adoption of total cost of ownership for sourcing decisions - a structural equation analysis. *Accounting, Organizations, and Society*, **30**(2), 167-191.

Appendix A

Questionnaire used in the main survey.

Note - the original questionnaire is in Danish, the English version has not been tested by back-translation, hence minor differences might occur.

Questionnaire Concerning Cooperation with other Companies

In this questionnaire I request you to answer the questions with the company you are in charge of as point of reference.

In this first section I request you to answer some general questions concerning your company.

To what industry is your company primarily related?

- Food, beverages, and tobacco.....
 - Textiles, clothing, and leather.....
 - Wood products, and furnitures.....
 - Paper products, and printing.....
 - Chemicals, and plastic products.....
 - Non-metallic mineral, etc.....
 - Basic metals, machines, and equipment.....
 - Electrical and optical equipment.....
 - Other industry..... Please specify
-

What is the number of employed persons in your company? _____
Write number

What was last years annual sales of your company? _____ million DKK

In this part I request you shortly to describe what you believe makes an advantageous relationship with other companies.
E.g. on what criteria do you choose business partners to co-operate with.

In this part I request you to express your degree of agreement about the following statements concerning business conditions of your company.

A. Topic:

Focus on Core Competences.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) We have actively chosen to be superior within specified areas....	<input type="checkbox"/>				
2) We are greatly respected for our core competences.....	<input type="checkbox"/>				
3) Our core competences are the central point of the strategy of the company	<input type="checkbox"/>				
4) We have a precise description of our core competences.....	<input type="checkbox"/>				
5) Our core competences are applicable in many contexts.....	<input type="checkbox"/>				
6) We do everything possible protect our core competences from being copied by our competitors.....	<input type="checkbox"/>				
7) We are all the time seeking new areas where to employ our core competences.....	<input type="checkbox"/>				

B. Topic:

Degree of Product Differentiation

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) Our products are specified in accordance with each customer.....	<input type="checkbox"/>				
2) We prefer to deliver a number of standard products.....	<input type="checkbox"/>				
3) Our customers rarely requires modifications of our products.....	<input type="checkbox"/>				
4) Different requirements made by our customers often involves modification of raw material and semi-manufactured product bought from suppliers.....	<input type="checkbox"/>				

C. Topic:

Focus on product development

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5) We continuously develop our products.....	<input type="checkbox"/>				
6) We perceive development of new products as an essential task.....	<input type="checkbox"/>				
7) We often discuss modifications of our products.....	<input type="checkbox"/>				
8) Product development is made in close co-operation with the future buyers.....	<input type="checkbox"/>				

In this part I request you to answer a number of questions concerning the customers and suppliers of your company (the relations of the company).

D. Topic:

Number of relations with external partners.

(You do not have to specify the exact number; it is magnitude I request for, hence an approximate number is sufficient).

- 1) How many customers does your company have? _____ Write number
- 2) How many of these customers would you classify as:
 'Very important customers' _____ Write number
- 3) How many of these *Very important customers* would you classify as:
 'Customers with whom we have a close relationship' _____ Write number
- 4) How many suppliers does your company have? _____ Write number
- 5) How many of these suppliers would you classify as:
 'Very important suppliers' _____ Write number
- 6) How many of these *Very important suppliers* would you classify as:
 'Suppliers with whom we have a close relationship' _____ Write number

E. Topic

Co-operation with existing partners (relations)

- | | Strongly
Disagree | Disagree | Neutral | Agree | Strongly
Agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1) We are actively seeking to have the right relations at the right time..... | <input type="checkbox"/> |
| 2) We want complete openness with our relations..... | <input type="checkbox"/> |
| 3) We are aware what our relations can and want..... | <input type="checkbox"/> |
| 4) We manage our relationships with our goals and strategies as point of reference..... | <input type="checkbox"/> |
| 5) We continuously evaluate the value of our relations..... | <input type="checkbox"/> |
| 6) Management and content of our relations has great significance for the competitiveness of our company..... | <input type="checkbox"/> |

F. Topic:

Establishment of new relations

- | | Strongly
Disagree | Disagree | Neutral | Agree | Strongly
Agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1) Establishment of new relations happens by coincidence..... | <input type="checkbox"/> |
| 2) Establishment of new relations happens through existing relations | <input type="checkbox"/> |
| 3) Establishment of new relations happens via social relations, not necessarily directly related to the company..... | <input type="checkbox"/> |
| 4) We most often enter new relationships with other companies we are acquainted with..... | <input type="checkbox"/> |
| 5) A correct match is more important than acquaintance in advance | <input type="checkbox"/> |
| 6) We perceive it as being risky to enter new relations..... | <input type="checkbox"/> |
-

In this last part I request you to describe the importance of trust in the relations of the company, and what kind of information that is exchanged between your company and the relations associated to it.

G Topic:

Trust in the relations of your company

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) Without trust co-operation is impossible.....	<input type="checkbox"/>				
2) We feel no need to control our relations.....	<input type="checkbox"/>				
3) We have trust in that our relations do not exploit us.....	<input type="checkbox"/>				
4) Conditions for co-operation has to precisely formulated and preferably in a written contract.....	<input type="checkbox"/>				
5) We have trust in that all parties benefit from the co-operation.....	<input type="checkbox"/>				
6) You cannot control everything, and that is why trust is crucial....	<input type="checkbox"/>				

H. Topic:

Exchange of managerial information with the relations of the company

(By managerial information is meant information that might or will influence decisions concerning than control of the company)

For relations with whom you are closely related

	Never	Seldom	Regularly	Often	All the time
1) How often do you exchange information on an informal basis? (e.g. exchanging gossip, how things are going, current problems, etc.)	<input type="checkbox"/>				
2) How often do you exchange non-financial information formally.... (e.g. relevant performance measures, orders in pipeline, plans for produktion, etc.)	<input type="checkbox"/>				
3) How often do you exchange financial information..... (e.g. profitability on products in focus, cost structure, etc.)	<input type="checkbox"/>				
4) How often do you exchange information of strategic importance.. (e.g. plans for produktdevelopment, marketing plans, etc.)	<input type="checkbox"/>				

For relations with whom you are loosely related

	Never	Seldom	Regularly	Often	All the time
5) How often do you exchange information on an informal basis? (e.g. exchanging gossip, how things are going, current problems, etc.)	<input type="checkbox"/>				
6) How often do you exchange non-financial information formally.... (e.g. relevant performance measures, orders in pipeline, plans for produktion, etc.)	<input type="checkbox"/>				
7) How often do you exchange financial information..... (e.g. profitability on products in focus, cost structure, etc.)	<input type="checkbox"/>				
8) How often do you exchange information of strategic importance.. (e.g. plans for produktdevelopment, marketing plans, etc.)	<input type="checkbox"/>				

Do you have any comments regarding the subject or the questionnaire, I request you to write them on the enclosed paper. Alternatively you are welcome to contact me either via e-mail (mja@asb.dk) or by telephone (89 48 61 89).

And finally I will thank you for your help.

Appendix B

Covariance matrix related to the manifest variables included in the structural equation model.

	E1	E2	E3	E4	E5	E6	G1	G2	G3	G6	H1	H2	H3	H4	H5	H6	H7	H8	
E1	0.900	0.405	0.519	0.494	0.575	0.501	0.114	0.026	0.176	-0.037	0.083	0.032	0.103	0.054	0.183	0.218	0.114	0.106	
E2		0.822	0.379	0.295	0.358	0.218	0.088	0.195	0.099	0.123	0.174	0.184	0.183	0.167	0.214	0.169	0.114	0.125	
E3			0.797	0.465	0.559	0.417	0.118	0.009	0.111	0.050	0.120	0.095	0.193	0.118	0.233	0.209	0.106	0.181	
E4				0.717	0.578	0.464	0.136	-0.060	0.114	0.024	0.135	0.089	0.094	0.142	0.155	0.179	0.083	0.101	
E5					1.042	0.523	0.100	-0.042	0.033	0.052	0.211	0.244	0.286	0.256	0.296	0.303	0.177	0.238	
E6						0.800	0.180	-0.111	0.113	0.036	0.139	0.084	0.181	0.185	0.133	0.235	0.065	0.112	
G1							0.387	0.116	0.145	0.127	0.068	0.070	0.060	0.157	0.041	0.002	-0.063	-0.013	
G2								1.334	0.439	0.233	-0.178	-0.004	0.103	0.094	-0.016	0.130	-0.029	0.017	
G3									0.616	0.062	-0.087	-0.027	0.075	0.034	-0.044	0.061	0.011	0.023	
G6										0.578	0.055	0.068	0.079	0.172	0.072	0.070	0.064	0.153	
H1											0.593	0.307	0.175	0.245	0.452	0.233	0.119	0.228	
H2												0.706	0.269	0.252	0.249	0.309	0.191	0.175	
H3													0.850	0.352	0.127	0.208	0.320	0.262	
H4															0.731	0.193	0.261	0.189	0.381
H5																0.830	0.485	0.290	0.420
H6																	0.824	0.445	0.575
H7																		0.642	0.536
H8																			0.958

Note: The labels refer to the labels from the questionnaire presented in appendix A. The letters refer to the sections in the questionnaire, and the numbers refer to the statements within the sections.

Appendix C

Coefficients corresponding to the complete structural equations model regarding the latent variables: *Network Control (NC)*, *Trust*, *Information - Strong Ties (IST)*, and *Information - Weak Ties (IWT)*.

	Regression Weights			Standardized
	Estimate	Standard Error	Critical Ratio	Regression Weights
<i>Network Control:</i>				
E1 <----- NC	1.000			0.820
E2 <----- NC	0.750	0.130	5.785	0.649
E3 <----- NC	0.879	0.118	7.463	0.759
E4 <----- NC	0.870	0.115	7.543	0.800
E5 <----- NC	1.118	0.147	7.600	0.846
E6 <----- NC	0.708	0.109	6.520	0.701
<i>Trust:</i>				
G1 <----- TRUST	1.000			0.497
G2 <----- TRUST	2.406	0.922	2.611	0.679
G3 <----- TRUST	1.893	0.702	2.699	0.673
G6 <----- TRUST	1.022	0.452	2.260	0.377
<i>Information - Strong Ties:</i>				
H1 <----- IST	1.000			0.597
H2 <----- IST	1.069	0.289	3.702	0.560
H3 <----- IST	1.257	0.369	3.409	0.573
H4 <----- IST	1.223	0.338	3.615	0.628
<i>Information - Weak Ties:</i>				
H5 <----- IWT	1.000			0.664
H6 <----- IWT	1.367	0.191	7.157	0.876
H7 <----- IWT	1.097	0.180	6.093	0.814
H8 <----- IWT	1.315	0.209	6.283	0.819
<i>Covariances (Latent variables):</i>				
NC <-----> TRUST	0.040	0.030	1.319	
NC <-----> IST	0.115	0.044	2.596	
NC <-----> IWT	0.171	0.057	2.995	
TRUST <-----> IST	0.024	0.019	1.300	
TRUST <-----> IWT	0.026	0.021	1.213	
IST <-----> IWT	0.132	0.050	2.652	

Validity measures of the model:

Chi-square	=	131.32
Degrees of Freedom	=	125
Probability Level	=	0.33
Adjusted Goodness of Fit	=	0.80

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